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A N  
INAUGURAL DISSERTATION  
ON THE  
DIARRHOEA INFANTUM.

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SUBMITTED *to the* PUBLIC EXAMINATION  
OF THE  
FACULTY OF PHYSIC,  
UNDER THE AUTHORITY OF THE  
TRUSTEES OF COLUMBIA COLLEGE,  
IN THE  
STATE OF NEW-YORK:  
WILLIAM SAMUEL JOHNSON, L. L. D. President;  
FOR THE DEGREE OF  
*DOCTOR of PHYSIC;*  
ON THE FIFTH DAY OF MAY, 1795.

---

By PETER ANDERSON, A.B.  
And Citizen of the State of New-York.

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Non fasces, itaque, non purpuram, non extructas in altum divitias,  
non ingenium artibus atque scientiis utcumque ornatum et imbutum;  
sed animum communi utilitati inservientem, dignitas sequitur.  
NICHOLS.

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Imprimatur

W. P. SMITH.

WILLIAM SAMUEL JOHNSON, *L. L. D.*

PRESIDENT *of* COLUMBIA COLLEGE;

Whose Eloquence, Wisdom and Talents,

as an

ORATOR and STATESMAN;

Whose elegant Erudition, as a Scholar;

And whose Virtue and Philanthropy, as a

Member of Society,

Will ever render his name justly respected.



NICHOLAS ROMAYNE, M. D.

*My Able and Faithful Tutor ;*

A person eminently distinguished for his deep, and extensive acquaintance, with the whole circle of Medical Science, for his humanity and usefulness, in the practice of his profession ;

And for his politeness, as a Gentleman :

T H I S

D I S S E R T A T I O N

Is Inscribed,

With the most sincere sentiments of gratitude  
and respect,

By their obliged Friend,

And fellow-citizen,

The AUTHOR.

M<sup>r</sup> Nathaniel Riker  
with respectful  
compl<sup>ts</sup>, from  
his friend  
The Author.

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A

D I S S E R T A T I O N

ON THE

DIARRHOEA INFANTUM.

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NO diseases, to which man is subject in the different progressive stages of his life, more necessarily claim our compassion, and the extension of medical aid, than those which are incident to the periods of infancy and childhood. The great sensibility and irritability of infants, the acescent nature of their food, their incapacity for exercise, and, above all, the mismanagement of those, who have the immediate care of them, render them peculiarly the subjects of pain and disease. So great, indeed, is the mortality among children, in large cities, that, by pretty accurate estimates, it has been found, that above one half of them die, within the first four and five years.\*

Until the age of five, "human life, like a fire beginning to burn, is very feeble," and easily extinguished.—Various are the causes and seats of these diseases. But some of the most frequent, and such as are attended with the most distressing symptoms, are those, which affect the alimentary canal. Of such general importance to the human œconomy, has the due action of these parts been deemed, that Hippocrates and some others of the ancient Physicians, considered a morbid and deranged state of them, as the principal and

\* Gregory's Comp. View---Price on Annuities---Smith's Letters---

ordinary source of infantile diseases. Certain we are, that this class of diseases, both from the frequency of their occurrence, and the great mortality attending them, demands the nicest attention. I shall, however, confine myself to the consideration of one particular genus of them, the *Diarrhœa*, or purging of Children. This disease, particularly in its most malignant forms has been viewed as a species of *Cholera morbus*, and hence denominated the "*Cholera Infantum*." But, that this is not, in general, a different disease from the *Diarrhœa*, but merely a variety or modification of the same species, will I conceive, fully appear from the following considerations.

1. Because it attacks children of the same age, and habit of body, as the *Diarrhœa*.

2. That, in a great proportion of cases, even in the *summer months*, a simple *Diarrhœa* alone appears, unaccompanied with any vomiting.

3. That, even in those instances, where a vomiting does truly take place, it is often merely of the aliment taken in, of a sour, greenish, or other matter different from bile.\*

4. Bile seldom appears in the first acts of vomiting, and seems afterwards to be poured too copiously into the stomach and duodenum, from the previous agitation of the abdominal viscera, and the debility and relaxation induced. The more frequent appearance of vomiting in the *Diarrhœa* of Infants, than in that of Adults, arises from the greater irritability of the former, than of the latter.

5. It is destitute of some of the other symptoms of a genuine Cholera.

6. It is probable, both from the nature of children's food, and the general disposition of their systems to a superabundance

\* Gerardi Van Swieten Comment. in Boerh. Tom. 4.---Halleri opera majora Tom, 6. P. 548.

dance of acid, as well as from the evident marks of acidity in the primæ viæ, that a true Cholera does seldom occur.

7. This probability is further supported by the well known mild and inert nature of the bile in infants.\*—"In infants the bile is frequently not sufficiently active, and generally secreted in too small a quantity, which in them induces diseases of prevailing acidity."†

8. And, lastly, we may conclude both complaints to be generally of the same nature, as well from their origin, which is mostly in the form of a Diarrhœa; as also the method of cure and prevention, which rest principally upon the view of obviating and correcting acidity. The treatment being likewise different from what is proper in the Cholera of adults; and in infants, nearly the same, whether accompanied with vomiting or not, and in cases of vomiting, whether with bile, or any other matter.

From all these considerations, it will be pretty evident, that a vomiting, and other violent symptoms, and even a vomiting of gall are not always sufficient to constitute a different genus of disease, but only perhaps a distinct species or variety, included under the Genus Diarrhœa.‡ HIS-

\* Halleri Physiologia.

† Dr. Saunders on the liver.

‡ The size of the liver in the fœtus, and soon after birth, is no proof of a contrary doctrine; as it is particularly large in the former state, without any known adequate use for the bile. And as other Glandular parts are also larger at these two periods, than at any other period, without our being able to ascertain their uses. "We do not know the whole function of the liver: we know that its principal use in the Adult, is to secrete the bile, but then in the fœtus it occupies the greater part of the cavity of the abdomen, and a considerable portion of the blood, returning from the placenta, circulates through its substance. It occupies less space in proportion in the cavity of the abdomen, as the body grows up, and it is more than probable, that it performs some function not yet understood." What greatly favours this opinion, is, besides the size of the blood-vessels, distributed to the liver, the great number of absorbents it contains. These last are double the number of its blood-vessels, and more than are sent to any other viscus in the human body. See Cruikshank "on the Absorbent System."

## HISTORY of the DISEASE.

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Definition — Dejectio frequens; morbus non contagiosus; pyrexia  
acuta primaria.

Culleni. *Nosologia Method*

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THIS disease may arise at any period of the infant state; and few children entirely escape it. It also assumes various appearances. But, it is my intention to describe it only, as it occurs as an idiopathic disease; and, more particularly, that form of it, which prevails during the warmer seasons of the year.

Although this complaint may attack children of any age; we find that it most frequently occurs from the second or third week after birth, until the third and fourth year. It becomes most prevalent, and is attended with symptoms of the greatest danger and malignity, during the warmer months of summer; and the beginning of autumn; when it is known by the common name of "*The Disease of the Season.*" It always spreads, and assumes a more dangerous form, in proportion as the heat of the season increases. Also, as the weather is subject to sudden and considerable vicissitudes of heat and cold. Sudden and long continued falls of rain, after a very warm and dry state of the atmosphere, greatly favour the operation of the exciting causes. For these reasons, we find, that during the course of the summer of 1793, it prevailed, in this city, to an alarming and dangerous degree; whereas, from the mildness and almost uniform temperature of the atmosphere, during the last summer, it was comparatively of rare occurrence. It generally begins in the month of June or July, and continues till the latter part of September. Although, from

the premature heats of summer, it may appear much earlier; or, from the unusual continuance of the same, be considerably protracted.

The first appearance of this disease is marked commonly by a moderate degree of looseness; though sometimes, a constipation preceeds the Diarrhœa. This looseness is distinguished, according to the appearance of the matter discharged. The most common appearance of it is green, and curdled, emitting a sour, and peculiarly rank odour; but, the stools are also clayey, watery, bloody and fetid. In some cases, particularly in the advanced stages of the complaint, they consist (as in the Lientery of Adults) merely of the aliment taken in, without having undergone any material change in its passage. Acid and bitter eructations generally attend. Vomiting, also, frequently occurs throughout the course of the complaint, particularly during the excessive heats of Summer. The matter thrown up is green, or yellow. Sometimes the vomiting continues without the purging; though more frequently the contrary. The abdomen is often affected with a considerable hardness and swelling. These symptoms are accompanied with severe pain and griping; which we may know from the child's starting, and frequent fits of crying, when attempting to sleep, and the forcible contraction of its arms and legs towards the abdomen. A great degree of thirst mostly attends. The pulse is weak, quick, and frequent. The skin hot and dry, especially about the head; but, as the disease advances, the extremities become cold; sometimes remarkably so, while the belly is as remarkably hot. In long-continued Diarrhœas, a procidentia ani sometimes takes place, which proves a very obstinate and troublesome symptom. The duration of the disease is

various. In some instances, it terminates in a few days; but, in others, it continues with little or no remission, for a month or more. I have known it to continue, in some children, for three, four, and five months, with very few occasional alterations. Eruptions on the skin, will sometimes appear during its progress. And, in complaints of long standing, a peculiar tightness of the skin (called *skin-bound*) is said by medical writers, to take place.\* In the worst stage of it, there is a constant inclination for stool, though the stools are little in quantity, watery and green.—At last the eyes become hollow and languid, with something of a pearly whiteness in them, the body is so greatly emaciated, that the bones almost protrude through the skin, a sore mouth, livid spots, hiccup, convulsions, and a strongly marked hippocratic countenance generally precede the fatal termination.†

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## D I A G N O S I S.

THE diseases, with which a Diarrhœa in children, may be confounded, are a genuine *Cholera morbus*, a *Dysentery* and *worms* in the alimentary canal.

1. To distinguish it from *Cholera*, we may be assisted, in some degree, by attending to the season, in which it happens; by the matter vomited, as well as that discharged by stool, being entirely of a bilious nature, in the latter; from this complaint being of short duration, and attended with violent symptoms from its commencement.

2. From the *Dysentery*, by its not being contagious; by its not being attended with that pungent pain, griping, and

\* Dr. Underwood.

† Dr. Rush's Med. Inquiries, vol. 2.

tenesmus, which are so distressing in *Dysentery*. We may also form our judgment, from the fever not being of that highly *typhous*, *malignant* nature, that it is in the latter complaint, and, upon the whole, from the *Dysentery* being a very rare disease among children.

The 3d. disease, with which it may be confounded, is the affection, arising from *worms* in the alimentary canal. But from this, it will be sufficiently distinguished, from there not having been any worms discharged in the first attack of the disease; from an attention to the epidemic constitution or nature of disease most prevalent; and from its not having been preceded by a voracious appetite, disturbed sleep, &c. The appearance of the stools will be different; and the essential characteristic symptoms of worms will be wanting.

## C A U S E S.

THESE, as usual, shall be divided into the *Remote* and *Proximate*; and the first subdivided into the *Predisponent* and *exciting causes*. We shall consider them, as they succeed each other, in the order of time, and approximate the perfect state of disease.

## P R E D I S P O N E N T C A U S E S.

“PREDISPOSITION, being that state of the body, which renders a person susceptible of the operation of the Exciting or Occasional causes;” the following may be viewed as the principal *predisponent causes* of the complaint, under consideration.

1. An hereditary disposition, arising from weak and depraved parents, producing a weak, sickly organization.

2. A peculiar irritable state of the system, or of the stomach and bowels, arising either from natural conformation, independent of hereditary taint, or a diseased state of the body; as happens frequently from dentition, &c.

3. A particular state of the atmosphere, either a very warm, and moist, or cold and variable state of it.

4. A diet affording little nutritious matter, or, at least, affording matter, which requires to undergo certain changes from fermentation, in the stomach, before it can be converted into chyle. Hence a vegetable diet, either in whole or chiefly so, and of a bad quality, often lays the foundation for this disorder.

5. Breathing an impure and confined air.\*

6. The want of that due exercise, the desire of which is instinctively implanted in the breast of every child.

7. An inattention to cleanliness.

8, and lastly. The neglect of purging off the *meconium*, soon after birth, frequently lays the foundation for this complaint, by irritating and overstretching the intestines.†

## EXCITING CAUSES.

ONE of the most frequent exciting causes of diseases of the alimentary canal in children, is generally allowed to be a superabundant acidity.‡ This appears to be such a common

\* Dr. Bryan Robinson has shewn, that infants contain more blood, in proportion, than adults. And it is well known, that their circulation is much quicker, and of course their respiration. Hence there is a greater quantity of impure air emitted from their lungs. See *Memoirs of the Arts and Science*, Vol. 2d.

† Dr. Underwood's "Treatise on the disease of children."

‡ Harris "de morbis Infantum." Cullen's "First Lines."

mon cause, that HARRIS, who is esteemed a very good writer on the diseases of children, has attributed every morbid affection, to which the infant state is liable, to this source. And, in fact, from the food of infants being of a very aciescent nature, and readily undergoing fermentation in the stomach, as well as from various phænomena, that take place, we can have little doubt of acidity being a very common cause of this disease.\*

But, perhaps, acidity is more frequently a *consequence* of debility and disease; than the *cause* of them.

The 2d. cause is irregularity in diet. The tender bowels of children may either be oppressed by too great a quantity of food, or irritated by that, which is difficult of digestion, and liable to become acrimonious from its delay in the first passages.

A 3d. cause may be supposed to be passions of the mind, either in the *nurse*, or *child*. That the first may operate by altering the quality and quantity of milk secreted, is very probable from the very intimate connection, and mutual influence, which subsist between various emotion of the mind and glandular secretions. And, that passions of the  
mind

\* I would not have it understood, from what is here said, that I suppose the milk of the mother to be the general cause of this morbid acidity. Milk, both from its general properties, and its being almost the universal food, provided by nature, for the nourishment of the new-born animal, is evidently the best adapted for the weak digestive organs of Infants. But, when the stomach of an Infant is debilitated, or when the milk of the nurse becomes vitiated by grief or other emotions of the mind, disease, or improper food, it may undergo similar changes to vegetables, from fermentation. These last very readily pass through the acid fermentation, when exposed to a moderate heat, out of the body. Hence probably, in certain states of the system, similar changes take place, during the process of digestion, in the stomach and intestines. Mr. Moss (of Liverpool) gives it as his opinion, that of all the children, in the Island of Britain, that are dry-nursed, and who die under four months, two thirds or even three-fourths fall victims to complaints in the stomach and bowels, occasioned by improper food.—Sir John Pringle, and Dr. M'Bride on Fermentation.—Moss on Nursing.

mind in *infants*, will produce Diarrhœa, may be concluded from the powerful effect they have on the brain and Nervous System, which in infancy are peculiarly large and sensible. In confirmation of it, we may also adduce the instances of *adults*, who are liable to the same complaint, from a similar cause.\*

4. The sudden repulsion of certain eruptions on the skin. This sometimes happens with the *Exanthemata*, the red Gum, &c.

5. The sudden stoppage of perspiration, from a moist and cold state of the atmosphere. An obstruction of perspiration may also arise from want of cleanliness, which may further operate by favouring the generation, if not actually generating an acrimony of the fluids. Cold particularly produces this disease, when applied to the feet,† and probably, from some part of the clothing of Infants, applied over the abdomen, being suffered to remain on damp and cold.

6. A very warm, and dry state of the atmosphere, particularly if long continued.

The 7th. and last cause of this complaint, is the use of the drastic purgatives, or the long and too frequent use of rhubarb, magnesia alba, &c. which by irritating the intestines may produce a Diarrhœa.‡

## PROXIMATE CAUSE. 2

In establishing the proximate cause of Diarrhœa, there has been a great diversity of sentiment among physicians.

Some

\* Gaubii Pathologia---Cullen's First Lines.

† Throwing cold water on the lower extremities, has lately been found a very effectual remedy in removing obstinate costiveness. Med. Comment. Edinb.

‡ Hamilton.

Some suppose it to consist in a spasmodic affection, arising from an atony and debility of the parts.\* Others affirm, that it arises from a laxity of the muscular fibres. Dr. BROWN classes it among the asthenic diseases, and alleges, that it arises from direct debility.† But, the most probable opinion seems to be that, which imputes it to an increased peristaltic motion, of the intestinal canal, arising from the action of stimulants.‡

What is the peculiar nature of the stimulants, that more immediately excite the action of this canal, is difficult to determine. Although, from many circumstances of their operation, as well as from direct poisons often operating in the same way; I am inclined to believe, that it is owing to some noxious quality in the substances, which in a certain quantity might prove destructive to the system.§

That acidity operates as a stimulus to the intestinal canal, may be inferred from the vegetable acids (of which nature is the acid in the stomach) readily exciting appetite, and increasing some of the secretions; as also the general beneficial effects of the fermented vegetable acid, as an external application, in obviating and correcting putrescency. Hence its frequent use in contagious fevers of great debility.

But, it is not improbable, that a redundant acidity is very much favoured in its operation, by exciting the mucous follicles of the intestines to a larger exudation of their contents, and rendering more acrid the mucus thus poured out. It may, also, have an effect of eroding the mouths of these vessels, as well as the inner coats of the intestines,|| and thus increasing their irritability. When

\* Hoffmanni Opera Omnia. Tom. 4. † Brunonis Elementa Medicinæ.

‡ Gaubii Pathologia---Cullen's Practice of Physic. § Cullen's Mat. Med.

|| Acrimony is known sometimes to produce an erythematic inflammation of the whole, or a part of the intestinal canal, and thus occasion a Diarrhœa.

When a Diarrhœa arises from a suppression of the perspirable matter, or the sudden repulsion of eruptions from the skin, it is to be imputed to the sympathy, that subsists between the surface of the body and the alimentary canal.

It remains still a question to be decided, how far, and in what manner, heat is to be considered as the cause of this disease. As this is a subject, which has not, to my knowledge, been fully examined by any medical writer, it would be great presumption in me to pretend to establish an opinion entirely free from objections. It however appears probable, that excessive heat operates first by indirectly debilitating and relaxing the surface of the body, and then, by consent of parts, relaxing the intestinal tube. We well know, that the skin and alimentary canal mutually participate in health and disease. Hence we may easily conceive, that, as the long application of violent heat may overstretch and relax the vessels on the surface, and cause an excessive discharge of perspirable matter; the internal parts, either at the same time, or during the interval of its application to the external parts, may suffer a preternatural exudation there of the various secretory discharges. These fluids may accumulate, and from stagnation and the continuance of heat, become preternaturally acrid, so as to irritate and excoriate the very delicate coats of the intestines.\* Acidity is always increased in the *primæ viæ*, during warm weather. And, as the application of stimulants, is generally more powerful, in proportion as the body is weakened, it appears evident, that the use of all indigestible food, &c. will much more readily induce disease. But, as this disease prevails especially at the coming

\* What greatly favours this opinion, is, that children who possess a much larger proportion of fluids, especially of the mucous kind, than grown people, and adults of a similar make, are particularly liable to this complaint,

ing on of cold and rainy weather, after great heats, we may suppose, that, from the sudden suppression of perspiration, and the relaxation of the system, there will be a greater afflux of fluids to these parts, which irritate in proportion to the debility.

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## PROGNOSIS.

THE extreme irritability of the infant system, rendering judgments drawn from the pulse precarious, their being easily reduced by sickness, and their incapacity to express their distress, as well as the difficulty of adapting our remedies to every particular emergency of early impotence, render a prognosis often extremely difficult. While on the other hand, children are not under the influence of many circumstances, which retard the recovery of adults. They are not influenced by various impressions on the mind, their diseases are far less complicated, their habits less vitiated, their wants but few and simple, seldom of a hurtful kind, and they appear to be more immediately under the guidance of nature. Hence it is the opinion of an elegant and judicious writer, that “ we ought never to *despair* of a child’s life, while it continues to *breathe*”.\*

When the discharge is moderate, and not of an acrid nature, if it does not injure the child’s health, and particularly, if sleep is little disturbed, and the functions of the stomach are not impaired, we may view the disease as in some measure, of a *harmless* nature.

We may generally predict a *favourable* termination, if the disease proceed from cold, or some little impropriety in diet; if, after the exhibition of the proper remedies, the vomiting

(when it attends) is suppressed, the purging either stops entirely, or in part, and the matter voided, assumes a more natural appearance, and especially if at the same time, an eruption appears on the skin.

If the child be dry-nursed, and his flesh become flabby, his colour pale, and the stools of a black colour, and fetid, the prognosis will be more doubtful.

But, when the disease is *epidemic*, when it has continued for a long time, attended with a frequent vomiting of acid or bilious matter, and an inability to retain any thing on the stomach, it will be very *unfavourable*. And, if a frequent hiccup, livid spots, that peculiar tightness of the skin (called skin-bound) a sore mouth, convulsions, and a general emaciation of the body supervene, it will terminate *fatally*.

## METHOD OF CURE.

Before we enter on the method of cure, it will be proper to remark, that it is not *every kind* or *degree* of Diarrhœa, that is to be viewed as a disease. A small degree of looseness is common, and may often prove of service to children. The bowels appear to be the great natural and critical outlet in them, as the kidneys and surface of the body are in adults.\* It is chiefly, when the disease arises from some *powerful* cause, or some cause often *repeated*, when the discharge is *excessive in degree*, or of an *unnatural appearance*, and particularly when threatened with symptoms of *debility*, that remedies become immediately necessary. I say *immediately* necessary, because the least delay, under such circumstances may often put it out of our power to afford any effectual relief.

We

\* Dr. Underwood.

We shall omit taking notice of any symptomatic Diarrhœa (arising from *dentition*, *worms*, &c.) as these require a method of treatment, suited to the *primary* complaint.

This disease may be often entirely *prevented* by a timely attention to obviating the remote causes, both predisponent and occasional. We may, for this purpose, employ every means for giving *strength* to the system, by the daily use of the *cold bath*, by the moderate use of *animal food*, of a light kind, and the occasional use of a little *Port Wine*. The utmost attention to cleanliness, the accommodation of the dress to the state and changes of the weather, and the removal of children to the country, at the approach of the *summer season*, will be of essential benefit.\*

Before we form our method of cure, it will be proper to attend to the *remote causes*, and to endeavour to remove, or moderate them. If the remote cause be cold and moisture, it will be necessary to obviate the effects of these, by keeping the patient warm and dry; or, if it proceed from improper food, to change it for that which is more wholesome.

In the *idiopathic* Diarrhœa, the indications of cure, as founded on the view of obviating and removing the *remote* and *proximate* causes, and as fully confirmed by *experience*, may be reduced to the following heads:

1. To evacuate the acrid *ordes* from the stomach and intestines.

2. To diminish the irregular action of the parts, and

3. To restore the strength and vigor of the whole system.

The first intention is answered by the exhibition of gentle *Purgatives*, and *Emetics*. But, we must observe here, that in some few cases, where the disease is far advanced, and symptoms of *great debility*, and other circumstances may

\* Rush, on the "Cholera Infantum."

contraindicate their use, we may pass over this indication, and have immediate recourse to the remedies hereafter to be mentioned. Though in general, it is of the utmost importance to attend carefully to emptying the stomach and bowels, and a circumstance that ought *by no means*, except in the instances before mentioned, to be neglected.

Perhaps one of the greatest errors in Medicine, and one which is nevertheless too often apparent, is a hasty and blind attachment to particular remedies, to the entire exclusion of others of equal, or perhaps superior virtues. It would, no doubt, be of great service in the practice of Physic, to keep in mind, and apply to most of diseases, the practical remark of the learned Boerhaave; "*Nullum se cognovisse remedium, quin solo tempestivo usu tale fieret.*" Physicians would not then obstinately adhere to one uniform mode of treatment, without any regard to the variety and succession of *symptoms*.\*

This has been a fault, particularly in treating the diseases of children. Some, from an idea, that acidity is the sole and primary cause of their diseases, have advised the constant use of *absorbent* and *alkaline* medicines. While others, probably from seeing the bad effects of the injudicious use of these remedies, and the advantages, in many cases, of *emetics*, have been as strenuous in their opposition to the former, and defence of the latter. Whereas, if we were more guided by reason, and the appearance of symptoms, we should seldom run into these excesses, and there would be less variation of opinion and practice among physicians.

\* "*Mutatis mutandis*," conduct should be regulated by circumstances, is a maxim fully as proper in Medicine, as in Morals and Politics. Both Harris and Armstrong, almost indiscriminately, recommend the use of their respective favourite remedies, and declare, "that they are as effectual in curing the Gripes," (as it is frequently called) "as the bark in intermittents."

\* In determining, whether *purgatives* or *emetics* are most proper to be administered, in this complaint, it will be highly necessary to attend to the particular symptoms. When the *bowels* alone are affected, so as to produce simply too frequent a discharge of their contents, without the affection being immediately communicated to the stomach, and unaccompanied with symptoms of fever, *purgatives* will be sufficiently safe.

If a want of the usual appetite, a loathing of food, or when aliments are taken in, an uneasiness in the time of their digestion, such as flatulence, acid eructations, &c. occur, *emetics* will be necessary. And it will be particularly necessary to have recourse to emetics, if along with sickness, nausea, and vomiting, the *febrile symptoms* run pretty high. Also, if the complaint has been of considerable duration, and returned several times, after having remitted, or entirely gone off. *Emetics* have some considerable advantages over *purgatives* in *Diarrhœa*, which render them particularly useful. They more effectually empty the stomach, and perhaps the smaller intestines, and determine freely to the surface. It is probable also, that vomiting may give some inversion of the peristaltic motion which is determined too much downwards in *Diarrhœa*.\*

The remedies proper to be employed as *cathartics*, are *rhubarb*, *magnesia*, or these combined, and in some cases, *elcmel* well prepared. This last is said to be particularly useful, given to children above four or five months old, in doses of half a grain, when the bowels are foul, and the stools very offensive.† *Manna* and *castor oil*, which have been

\* Van Swieten in Boerhaav.---Tom. 2, p. 389.---Cullen's First Lines.

† Dr. Armstrong.

employed, on this occasion, appear to me equally improper ; as the latter is very apt to become *rancid*, during warm weather ; and the former, from its being entirely of a *saccharine* nature, will readily increase the fermentation, and consequent acidity in the already debilitated stomach.

The *emetics* usually administered in this disease, are *Ipecacuanha* and the *antimonial* medicines. The *antimonial wine*, since the high character given of it by Dr. ARMSTRONG, has been viewed as almost a specific in the diseases of children in general, and of *Diarrhœa* in particular. But, as it is difficult to ascertain the exact dose of this medicine, from its difference of strength, which is *greater* or *less*, according to the *greater* or *less degree* of acidity of the wine in its preparation and from some other considerations ; the Tartar Emetic, as being less liable to variation, appears to me a preferable medicine. This last can be given in any necessary quantity, with a very great degree of exactness.

But, as some persons have strong prejudices against the use of this excellent remedy among children, in order to remove these prejudices or scruples, and to prevent the effects of an imprudent administration of this, and other emetics, the following circumstances are worthy of attention. Emetics ought never if possible, to be given to infants, on an *empty stomach* ; nor while the bowels are costive. Hence the most proper time for their exhibition, is generally the *evening*.

We ought to be careful not to give with the *antimonial* emetics, any *acid* or *acid drink*, as *lemonade*, or even *sugar*, which is too often combined with these medicines. It will also contribute to render the operation more mild, if instead of the common mode of dissolving the emetic substance, in a small quantity of water, we add a large bulk of fluid. This will render the medicine more tasteless and agreeable (which  
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with children is an object deserving considerable attention) and prevent the emetic from *convulsing* and *cramping* the stomach. We shall also be more certain of a perfect solution of the emetic tartar.

In cases, arising from acid or putrid fordes in the stomach, *devoid of much fever*, the *Ipecacuanha* is sufficiently efficacious. When the complaint is occasioned by an obstruction of perspiration, and is attended with a hot and dry state of the skin, and, when from the marks of acidity and debility in the stomach, the emetic tartar may be viewed as not sufficiently safe, I would recommend the use of the *James's powder*. But as this medicine sometimes runs off too quickly by the bowels, it will be of service to add a grain or two of ipecacuanha to every dose of the James's powder. Some of the good effects of antimonials are justly attributed to their *relaxing the skin*, and producing a determination from the *internal parts*. For these purposes, the above powder must be highly advantageous, as it appears from observation, to possess the *diaphoretic* quality in a superior degree to all the other antimonial preparations.\*

If it be difficult, from the weakness and irritability of the stomach, to retain the emetic for a sufficient time, it ought to be given in very small doses, and often repeated. Or, we must have recourse to purgatives, combined with opiates; or medicines administered *per anum*.

The 2d. indication is to be fulfilled by the use of absorbents, opiates, the warm bath, particularly fomentations of the abdomen and warm emollient lavements.

There have been great prejudices entertained by some physicians, against the use of what are called *antacids*, or *ab-*

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*forbents*,

\* Dr. Romayne's M. M. Lectures---Practice of Physic, 1792---2.

*ferbents*,\* and *opiates*.† And, that the *indiscriminate* use of these remedies has done great harm, we cannot but lament. But, surely, after the stomach and bowels have been two or three times freely emptied of their acid contents (as before directed) there can be no impropriety in removing all remaining acid tendency, by the use of absorbents, usually given for that purpose, and in *allaying irritation*, by the same remedies and opiates. With respect, however, to these remedies, it will be proper to remark, that to derive benefit from them, the first ought to be administered in large doses, though not often repeated; and the latter is seldom to be given, while the stools are *green*, or have a very *unnatural appearance*. *Magnesia* is, in general, preferable to all other absorbent medicines. But, when given merely as an absorbent of acidity, it ought to be in its *pure* and *calcined* state. When given in its *impure* state, it is apt to occasion pain and flatulencies, from the disengagement of the *carbonic acid*. Given in the manner here directed, it is perfectly mild (free from causticity) and as it contains more of the real earth of magnesia, it must be more effectual.‡

To remove pain and irritation in the stomach and intestines, it will be of great service to apply flannels, wrung out of brandy and warm water, over the abdomen. And, where nothing can be retained on the stomach, to apply an opiate plaster, or a plaster made of some of the essential oils, and warm gums.

Our 3d. indication is to be answered by tonic and stimulant medicines, and a nourishing diet.

The principal tonic, or strengthening medicine in this, as in other diseases, attended with debility, is the *Peruvian bark*. But, as children are very averse to swallow medicines, which

\* Dr. Armstrong.

† Van Swieten Tom. 4 P. 662, &c. Harris.

‡ Black on Magnesia. Priestley on Air.

are nauseous to the taste, and that require to be taken in large quantities; for these, and some other reasons, it appears to me, that the bark ought seldom to be given to them in *substance*.\*

Various bitter, and slightly astringent substances, may also be advantageously given in the advanced state of the complaint, and after the free use of the before mentioned remedies.

Bitters, besides their power of strengthening the stomach, have the property of *correcting acidity* and *flatulence*, which they do out of the body.†

The stimulants employed are chiefly *aromatics* and the *warm seeds*, which are generally employed as *carminatives*. These are necessary in long continued Diarrhœas, where there is no fever, and where there is a considerable *spasmodic affection* of the bowels. It is sometimes of service to add these stimulants, or what is superior, a little of the volatile alkali well diluted, to the absorbent medicines. To these, or a combination of them with opium, it will often be necessary to have *immediate* recourse; especially when the patient is much weakened, and there is reason to think, that the offending matter has been already evacuated by the efforts of nature.

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\* The method of giving the bark in substance, is in many cases improper, on this account; that the ligneous and indigestible part of it must necessarily irritate and injure the very delicate coats of the stomach and intestines. Hence its readiness to be rejected; and, probably also, its frequently producing Diarrhœa, and pain and stricture in the thorax. That these effects arise from the woody part of the bark, we infer from the infusion of it in cold water and magnesia, being frequently retained on the stomach, after the bark in substance (as it is called) had been constantly thrown up. The addition of the magnesia, in the disease now treated of, is obviously advantageous. Dr. Ross's M. M. Lectures on Fevers.

† Cullen's Mat. Med.---Van Swieten.

But, an object of equal, or perhaps superior importance to any that has been mentioned, is the regulation of the diet. When children at the breast, are attacked with this disease, the nurse ought to avoid every thing that may injure her milk; if she has lived on a *vegetable* diet, she must change it for one of a more *animal* nature. It will be necessary to alternate the use of a little animal broth with the mother's milk to the child, or to change the nurse. And, when children are brought up by the hand, or somewhat advanced in age, we must employ chiefly the nutritious juices of animals, freed from all oily, indigestible matter, such as *veal* and *chicken-broth*, *beef-tea*, and *calves'-feet jelly*. Animal food, given in this manner, will, besides being easy of digestion, and affording a rich chyle, contribute greatly to correct the acid tendency in the *primæ viæ*. If the child be unable to take milk from the nurse, it will be necessary to substitute something, which approaches human milk as nearly as possible.\*

Some of the farinaceous substances, such as *salep*, *sago*, and *tapioca*, are also employed with advantage.

But, if all these medicines should fail, and children are attacked with this complaint, during the warm seasons of the year, it will sometimes be found, that the best remedy in this, as in the most of chronic diseases, will be *pure, country air*, and some gentle exercise of *gestation*.

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It would be ingratitude in me, were I to conclude this essay, without expressing, in the warmest terms, my sentiments of respect and esteem, to those medical gentlemen, from whom I have received repeated marks of friendship and

\* As *Asses'* or *Goat's*-milk, when these can be procured; or, by adding some part of fresh *Cow's* milk two parts of pure, well boiled water. See the germ.—Van Swieten in Boerhaav.—Mots on Nursing.

kindness. To Doctors Wm. Moore, R. Kiffam, and Wm. P. Smith of this city; as well as to Dr. Varick of New-Jersey, I am particularly indebted. Permit me to assure those gentlemen, that as long as useful and disinterested services merit regard, and while gratitude deserves to be viewed as a virtue, a grateful remembrance of their names shall not be effaced from my mind.

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